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Case Report

Excellent Aesthetics with Vital Bleaching and Porcelain Laminates Cooperation: A Case Report with 2 Years Follow Up

Abstract

Objective: Dental bleaching offers a conservative, simplified, and low cost approach to change the color of discolored teeth. The aim of this study is to present the restoration made with porcelain laminate veneers after vital bleaching.

Case Report: A 24 years old male patient referred to Dicle University, Faculty of Dentistry, Department of Restorative Dentistry, because of the complaint of discolouration of teeth with laminate veneer preparation of anterior maxillary central teeth. For this patient, Philips Zoom was chosen. This material contains 25% hydrogen peroxide, which facilitates significant whitening procedure with a start to finish time of less than an hour. Optional curing light was used according to manufacturer's instructions, suction was performed using a surgical aspirator tip. After this treatment patient went to Prosthetic Dentistry clinic and porcelain laminate veneers were cemented.

Conclusion: Vital tooth bleaching is an effective treatment modality that can significantly change the appearance of teeth. Sustainable multidisciplinary treatments is very effective in bringing the aesthetics and function.

Introduction

Aesthetic dentistry constitutes a significant part of restorative dental treatment. It is not enough to simply provide healthy teeth for today's patients, as they also demand a perfect smile [1]. Aesthetic needs of the patient affect the prioritization of dental treatment [2]. Therefore, the sequencing of dental treatments and the aesthetic demands of a patient must be directly evaluated by the clinician [3].

Discolouration which has formed for various reasons leads to aesthetic problems, especially in the anterior region. Several factors may cause discolouration of the teeth. Depending on the localization and etiology, discolouration may be seen from internal or external sources or a combination of the two [4,5]. External origin factors of discolouration such as tea, coffee, fruit juice, cigarettes and various mouthwashes cause an accumulation on the external surface of the tooth [4,6]. Internal origin causes of discolouration can be examined in two parts as systemic and local factors [7].

Vital whitening procedures applied in the treatment of

discolored teeth are a more conservative approach compared to porcelain crown and composite laminate veneer restorations [8]. Power bleaching is an office bleaching method developed to bleach teeth in a one chair office visit with a whitening agent such as peroxide used with or without an auxiliary such as heat or light [9].

Generally in office bleaching systems using a light in conjunction with peroxide rely on a high intensity light source to activate the bleaching agent. With the absorbing of thermal energy from the light, the disassociation of oxygen from the peroxide is improved which facilitates penetration into the enamel matrix to increase the bleaching effect. The master advantages of this system include: bleaching procedure is under the dentist's control, during the application soft tissues are protected, and the teeth bleach more quickly than other methods. Several new techniques and materials for in-office bleaching have been produced by manufacturers [10]. For this case, Philips Zoom was chosen (Philips, Los Angeles, USA). This material contains 25% hydrogen peroxide, which facilitates significant whitening procedure with a start to finish time of less than an hour.

Dental bleaching applications offers a conservative, simplified, and low cost approach to change the color of discolored teeth. The aim of this case report is to present the restoration made with porcelain laminate veneers after vital bleaching with Philips Zoom.

Case Report

A 24 years old male patient referred to Dicle University, Faculty of Dentistry, Department of Restorative Dentistry, because of the complaint of discolouration of teeth with laminate veneer preparation of anterior maxillary central teeth (Figure 1). After the clinical and radiographical examinations, it was found that root canal therapy and apikal resection history in maxillary right and left central and lateral incisors (Figure 2). Patient wanted to open the forehead teeth in the lower jaw. For this reason vital whitening was applied to all the teeth in the laughing line. Also devital bleaching was not done for devital teeth. For this patient, Philips Zoom was chosen (Philips, Los Angeles, USA). This material contains 25% hydrogen peroxide, which facilitates significant whitening procedure with a start to finish time of less than an hour. The teeth was cleaned with pumice slurry. Teeth were dried, gingival barrier was applied and then isolation was achieved with cotton tampons. (Figure 3). Optional curing light was used according to manufacturer's instructions (Figure 4), suction was performed using a surgical aspirator tip. Three applications were used to complete the in-office procedure. After the last application, all the applied gel was suctioned, washed with water. After this treatment patient went to Prosthetic Dentistry clinic and porcelain laminate veneers were cemented. Both light and chemically cured (dual-cure) resin cements (Variolink Esthetic; Ivoclar-Vivadent) were used for the cementation of porcelain laminate (Figure 5).

The color of teeth remain stable and there is no absence of any disturbance of patient in two years later control. After the 2 years period teeth were not discolored again (Figure 6).

Discussion

Although the mechanism of whitening has not been fully clarified, it is based on oxidation. The whitening agents generally used in dentistry are hydrogen peroxide, and various forms of hydrogen peroxide such as sodium perborate, and carbamide peroxide [11]. Hydrogen peroxide can be used at different concentrations. Although it is known that because of the molecular weight of hydrogen peroxide, it is easily diffused



Figure 1: Preoperative view of patient.

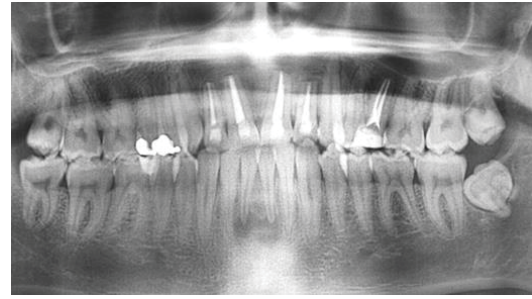


Figure 2: Panoramic radiography of patient.



Figure 3: Gingival barrier and cotton tampons view.



Figure 4: Zoom applying.



Figure 5: Postoperative view of patient with porcelain laminate veneers.

to the enamel and dentin, it is not fully known how it whitens the teeth [12]. According to the chemical theory explaining



Figure 6: View of patient after two years.

the bleaching reaction of hydrogen peroxide, active hydrogen peroxide is broken down into water (H_2O) and oxygen (O_2) and perhydroxyl free radicals (HO_2) form in a short period. The oxidative power of the free radicals can break large macromolecular stains down into small stain molecules [13]. In the current case, a prepartate containing 25% hydrogen peroxide was used.

Whitening techniques applied to vital teeth are known as 'power bleaching' when applied in the clinic and as 'nightguard vital bleaching' when applied at home on recommendation and under the supervision of the dentist. These techniques can be applied separately or combined [8]. With the onset of the use of rapid and reliable light sources, the use of whitening procedures in the clinic became more popular. Currently, peroxides are used together with an energy source in the clinic. Argon, carbon dioxide and diode lasers, plasma arc lamps, LED light sources, infrared lamps and quartz halogen lamps are all used for this purpose [8]. In the current case, the power bleaching method was applied by the clinician in the clinic. The Philips Zoom whitening system with an LED lamp (cold light) at 350–400 nm wavelength was selected for use.

The vital tooth whitening procedure can be applied in the dental clinic or at home. Whitening plates which have been designed to allow a certain amount of the whitening material to be hidden in the buccal section, are recommended by the manufacturers of dental whitening gel. However, researchers have reported that the design of these plates does not make any difference [14]. In the current case, there was not felt to be any need for plate application. The desired colour tone was achieved in a single session.

It has been reported that in 43% of patients where whitening has been applied with 10% carbamide peroxide, the colour of the teeth was the same after 10 years [15]. The current case was followed up for 2 years, and at the end of that period, although there was an amount of regression to the previous colour, patient satisfaction was of an acceptable level.

Whitening treatment applied to vital or devitalized discolored teeth has become a commonly used method nowadays. The most significant advantage of whitening treatment is that it does not impair the natural structure of the tooth. In accordance with the right indications, whitening

treatments can be applied before referring to traditional invasive methods such as composite or porcelain laminates or fully ceramic or metal supported crowns [11]. In the current case, a porcelain laminate preparation was started but then the patient was referred to our clinic and vital whitening was applied. The combination of porcelain laminate and vital whitening produced an excellent aesthetic result.

Most of the luting composites available today are supplied in dual-curing form for porcelain cementation. Conventional dual-curing composites based on BPO/amine and CQ/amine are by far not as colour stable as exclusively light-curing materials, since not only an amine needs to be provided for the light-curing process, but an additional amine is needed for the self-curing process. It is a generally accepted fact that the colour stability of a material decreases as the amine content increases. Variolink Esthetic is the first entirely amine-free luting composite on the market. In our case we used dual cured resin Variolink Esthetic and after two years there were no discolouration occurred again.

Side effects from bleaching vital and nonvital teeth have been documented. It should be noted that most of the research on bleaching has been performed on adult patients, with only a small amount of published bleaching research using child or adolescent patients [16–18]. Our case was a 24 years old adult man patient.

The more common side effects associated with bleaching vital teeth are tooth sensitivity and soft tissue irritation. Sensitivity affects eight to 66 percent of patients and often occurs during the early stages of treatment. Soft tissue irritation, in most cases, results from an ill-fitting tray rather than the bleaching agents and resolves once a more accurately fitted tray is used. Both sensitivity and soft tissue irritation usually are temporary and cease with the discontinuance of treatment [16,18,19]. Another side effect associated with bleaching vital teeth is increased marginal leakage of an existing restoration [16,18,20]. In our case the tooth sensitivity and tissue irritation was observed immediately after bleaching, but this is a temporary situation.

Conclusion

Dental whitening treatments, which are conservative and produce acceptable results should be considered as a treatment option in children and young patients. However, patients must be informed of potential complications such as cervical root resorption and re-discolouration of the tooth, and they must be followed up at regular intervals.

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